Chester, E.W. and B.L. Palmer-Ball. 2011. Second county records for two Kentucky endangered species, *Echinodorus tenellus* (Alismataceae) and *Schoenoplectus hallii* (Cyperaceae). Phytoneuron 2011-43: 1–4. Published 6 Sep 2001. ISSN 2153 733X

SECOND COUNTY RECORDS FOR TWO KENTUCKY ENDANGERED SPECIES, *ECHINODORUS TENELLUS* (ALISMATACEAE) AND *SCHOENOPLECTUS HALLII* (CYPERACEAE)

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ABSTRACT

Echinodorus tenellus and *Schoenoplectus hallii* are documented from Logan County, Kentucky, representing the second county of known occurrence in the state for each of these state-endangered species. As in the case of previous reports from Christian County, plants were found in an upland depression that had been flooded by excessive spring rains. Receding water in summer resulted in silt-loam flats where the species grew in abundance. The depression is mostly surrounded by cropland and flooded only in years where spring rains are excessive; otherwise the depression is in tilth.

KEY WORDS: *Echinodorus tenellus, Schoenoplectus hallii*, mudbabies, Hall's bulrush, Kentucky, Pennyroyal Plain

Echinodorus tenellus (Martius) Buchenau [*E. parvulus* Engelmann; *E. tenellus* var. *parvulus* (Engelmann) Fassett], mudbabies (Alismataceae), is a small (often only 4–8 cm in height at maturity in Kentucky) white-flowered annual often growing in mats. The species is known from scattered localities in eastern North America westward to Texas, Oklahoma, and Kansas, typically found in open sandy soils along margins of small streams or lakes (Haynes & Hellquist 2000). It is locally abundant but listed G3 (vulnerable) and either endangered, threatened, or historical in several states. In Kentucky it is S1 (critically imperiled) and endangered (Kentucky State Nature Preserves Commission 2011).

Schoenoplectus hallii (A. Gray) S.C. Smith (*Scirpus hallii* A. Gray), Hall's bulrush (Cyperaceae), is a tufted annual, mostly less than 20 cm tall at maturity in the Kentucky populations. Habitats include temporary ponds, wet places in cultivated fields, pastures, ditches, sinkholes, and prairies (Smith 2002). A recent study explored germination ecology (Baskin et al. 2003), showing that flooding, among other factors, is required for germination. A comprehensive status report (McKenzie et al. 2007) noted that within the prior 25 years, the species had been confirmed from approximately 84 sites scattered across 26 counties in 10 states. It is a G1 (critically imperiled) species and listed endangered, threatened, or historical in most states of known occurrence; it is S1 and endangered in Kentucky (Kentucky State Nature Preserves Commission 2011).

Previous observations and habitats for the two species in Kentucky.

Both species were first observed in 1983 (Chester & Souza 1984; Chester 1988) in a temporarily flooded depression in Christian County (Fig. 1) and both have appeared there during 16 of the past 29 summers. During other years (13/29, five consecutive 2003-2007), flooding did not occur or was of short duration and the depression was cultivated. The species were observed recently in four nearby Christian County sites, mostly during ornithological investigations by BLP-B. The

five sites were visited by the authors 30 July 2011; both species (Fig. 2) were present in all. Sites are on the southern Pennyroyal Plain, a karst region with numerous saucer-like depressions of <1-several ha within nearly level upland agronomic fields. When winter-spring rains are normal or above, the depressions may be flooded and as water levels drop during late spring-summer, a silt-loam flat is exposed and a few vascular plants (and a diversity of shore- and water-birds) appear. When rain is below normal, the depressions are cultivated with the surrounding fields and the rare species apparently persist in a soil seedbank.

The second Kentucky county record for both species.

This record for the two species was found by BLP-B on 14 July 2010, on private land in a depression as described above but in Logan County, about 50 km east of the Christian County sites (Fig. 1). The flooded area covered about 2 ha in spring 2011 but was reduced to 0.3 ha of shallow water on 27 July 2011. Hundreds of each species occurred in mixed stands on the resulting flats, on both sides of the bisecting, east-west and slightly elevated public road (Figs. 3 and 4).

It should be noted that such depressions are commonplace in Christian, Logan, and surrounding counties. Most are on private property, often deep within cultivated fields, and not accessible. We have visited several dozen but to date, the two rare species have been found only as noted above. Additional field work is warranted.

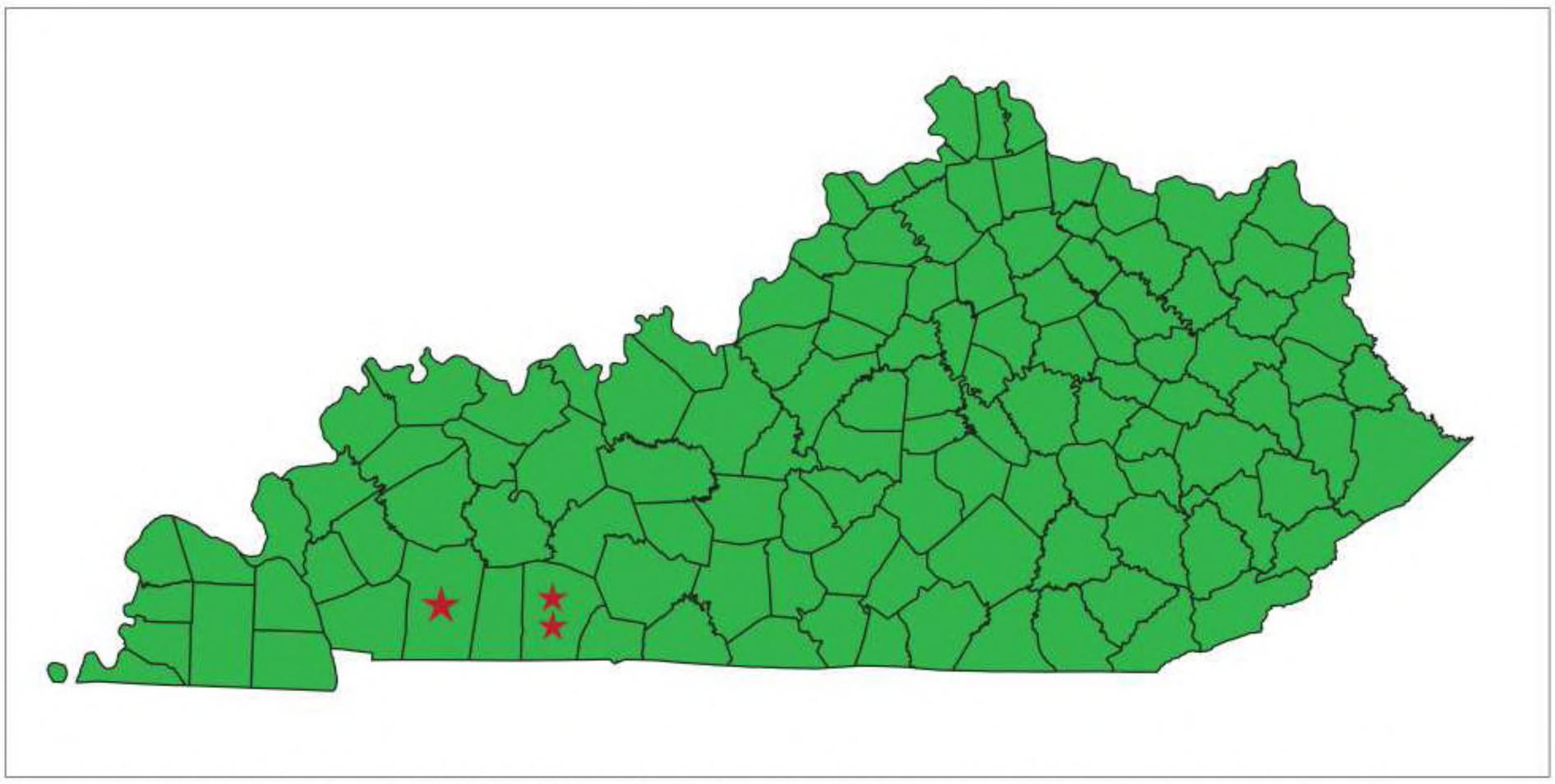

Figure 1. Map of Kentucky highlighting Christian Co. (one star) and Logan Co. (two stars).

Voucher specimens:

Kentucky. Logan Co.: John Young Road (an unpaved public road) 0.8 km west of junction with KY Highway 102, northwest of Keysburg, 36.672° N, 87.033° W; extensive population in open depression in a privately owned field where flooding had occurred earlier but shallow water now covering <1/4 of the depression, 27 July 2011, *E.W. Chester 14835* [for *Echinodorus*], *E.W. Chester 14836* [for *Schoenoplectus*], with Frank Lyne. Specimens to be distributed to APSC, BRIT, EKU, TENN.

Figure 2. *Echinodorus tenellus* (flowering plants <8 cm in height) and *Schoenoplectus hallii*, Logan County, Kentucky.

Figure 3. Temporarily flooded depression in Logan County, south side of John Young Road, with mats of *Echinodorus tenellus* (mostly) in foreground, agricultural crops in background.

Figure 4. Same site, north of John Young Road, with mixed stand of *Schoenoplectus hallii* (mostly) and *Echinodorus tenellus*.

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